

GCSE

Environmental and Land Based Science

Unit **B683/02**: Commercial Horticulture, Agriculture and
Livestock Husbandry (Higher Tier)

General Certificate of Secondary Education

Mark Scheme for June 2016

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Question		Expected Answers		Marks	Additional Guidance
1	a	Any 4 from: Clean tub Add stones/broken tile to aid drainage Mention of compost/ <u>sterile</u> soil Break up lumps (Slow release) fertilizer Water retaining gel Description of how the plants are inserted Spacing/pot size Which plants on the outside Which plants in the centre Complementary colours Watering		4	
	b	any 2 from Problems 1. Dry out quickly 2. Run out of food quickly 3. vulnerable to wind damage 4. water logging 5. overcrowding	Methods to reduce 1. Water regularly/ moisture retaining gel / automatic watering system 2. Slow release feed pellets / feed regularly 3. Erect in sheltered spot 4. clear drainage holes 5. pot on	4	Problems and methods to reduce must match.
2	a(i)	have a heating system eg cable, lack of draft, greenhouse effect, insulation from glass/plastic		1	
	a(ii)	Reduce thermostat, ventilate, switch off heater, water, shade		1	

Question	Expected Answers	Marks	Additional Guidance
b	Any one from Advantage – safer, better insulator, lower density. Disadvantage – Goes brittle / opaque with age ,degrades in sunlight	1 1	
c	Any one from Increased rate of water loss to keep cool; Increased rate of photosynthesis demanding more water; Loose more water because evaporation rate is higher: Increased uptake by the roots;	1	
d	D - warm and wet	1	
e	Any two from Build-up of pests Build-up of disease Loss of nutrients Loss of structure/organic matter	2	

Question		Expected Answers	Marks	Additional Guidance
3	a	D nitrogen fixation by non-legumes		
	b	<p>[Level 3] Compares both traditional and hydroponic methods of cultivation discussing the advantages and disadvantages of each including practical, economic and environmental issues. Explains why hydroponics systems are increasingly being used. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Describes both systems and a range of advantages/disadvantages of hydroponics systems over traditional systems. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Describes both systems and describes some advantages/disadvantages of hydroponics over traditional systems. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to A/A*</p> <p>Indicative scientific points may include:</p> <ul style="list-style-type: none"> • Traditional cultivation involves growing in the soil or in growbags/compost. • Hydroponics involves growing in water containing nutrients. • Hydroponics does not use peat which is better for the environment • Hydroponics reduces the likelihood of (soil born) pests and diseases • Hydroponics is better suited to automated / low labour systems than traditional methods • ICT enables close control of the growing environment in hydroponic systems pH , nutrients etc. • Hydroponic systems are expensive to set up initially • No need to purchase compost / grow bags etc once set up. • Hydroponics can be used in extreme environments such as the desert where traditional methods are not practical. <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>

Question		Expected Answers	Marks	Additional Guidance
4	a	700 (£/tonne)	1	
	b	April	1	
	c	<p>Any three from:</p> <p>April has a higher yield than any month apart from May and July.</p> <p>April has the highest gross price suggesting high demand</p> <p>However heating costs are likely to be higher than months later in the year reducing profit.</p> <p>Lighting may be needed in April</p> <p>picking rate may increase if the yield is high</p> <p>may need more pickers when the yield is high/ increased wages</p>	3	

Question		Expected Answers	Marks	Additional Guidance
5	a	A bacteria	1	
	b	Any two from Unclean conditions greater disease transmission Wet conditions lead to a build-up of disease Warm conditions lead to a build-up of disease Poor ventilation leads to a build-up of disease Overcrowding increases disease transmission	2	
	c	Milk from cows treated with antibiotics can contain antibiotics. Small traces of antibiotics in the diet can increase bacterial resistance to antibiotics within the human population.	1 1	

Question	Expected Answers	Marks	Additional Guidance
d	<p>[Level 3] Covers all areas of legislation including vehicle, driver, animal identification and paperwork. Explains how these help to reduce disease within both the animals and the farm. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Covers most areas of legislation from vehicle, driver, animal identification and paperwork. Describes how these help to reduce disease within the animal population. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Covers some areas of legislation and describes at least one way disease is reduced by this legislation. Development of concept give second mark. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to A/A*</p> <p>Indicative scientific points may include:</p> <p>Legislation</p> <ul style="list-style-type: none"> • Vehicle design to enable easy cleaning to reduce disease transmission. • Animals must be healthy before transport. • Drivers must be trained to transport the animals. • Animals must be individually identifiable e.g. ear tags, brands, micro-chips etc. • Need for correct movement paperwork • Need for passports for animals being transported. • Records of movements to be recorded. • Food/water stops • Standstill after an on movement <p>Disease reduction.</p> <ul style="list-style-type: none"> • Cleaning the vehicle reduces disease transmission between livestock. • Only transporting healthy animals reduces disease transmission between livestock. • Driver training ensures correct procedure is followed. • Animal identification enables traceability • Paperwork enables quick identification / reduction of disease transmission within the food chain. <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>

Question		Expected Answers	Marks	Additional Guidance
6	a	3.1 or 3.1:1	1	Reject 1:3.1
	b	A	1	
	c(i)	17 (⁰ C)	1	+/- 2 ⁰ C. (15 ⁰ -19 ⁰)
	c(ii)	any two from As it gets hotter the animals eat less because they need less energy to keep warm or eat more in cold weather for energy to keep warm Pigs less active when they are hot so eat less or pigs more active when cool so eat more Their growth rate is less at high and low temperature because of environmental stress	2	

Question	Expected Answers	Marks	Additional Guidance
7	<p>[Level 3] Explains the processes involved in the stages of fertilization, development and birth of a mammal. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Describes at least two of the stages of fertilization, development and birth of a mammal. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Describes some aspects of fertilization, development or birth of a mammal.. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Indicative scientific points may include:</p> <ul style="list-style-type: none"> • The need for mammals on the farm to be on heat for mating to take place • The signs that the chosen animal is on heat. • The process of mating • The movement of sperm following insemination towards the egg • The entry of sperm into the egg • The process of fertilization • An outline of the changes from fertilized cell to embryo and foetus. • Gestation period for the chosen animal • The changes in the mother and baby in the hours before birth • Correct nutrition necessary for healthy development of embryo • Description of the actual process of birth • Role of the farmer in the birthing process <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>

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